Claims

What is claimed is:

1. A power amplifier circuit comprising:

a first input node adapted to receive a radio frequency signal when operating in a first frequency band;

a second input node adapted to receive the radio frequency signal when operating in a second frequency band;

an array of transistors, each transistor having an input and an output, wherein the outputs are coupled together to form a power amplifier output;

a first matching circuit coupling the first input node to the inputs of each transistor in the array of transistors, the first matching circuit having a small impedance when operating in the first frequency band and a large impedance when operating in the second frequency band; and

a second matching circuit coupling the second input node to the inputs of each transistor in the array of transistors, the second matching circuit having a small impedance when operating in the second frequency band and a large impedance when operating in the first frequency band.

2. The power amplifier circuit of claim 1 wherein the first matching circuit further comprises first capacitive circuits coupling the first input node to the inputs of the transistors in the array of transistors, further wherein the second matching circuit further comprises second capacitive circuits coupling the second input node to the inputs of the transistors in the array of transistors.

3. The power amplifier circuit of claim 2 wherein the first matching circuit further comprises a first inductive shunt circuit coupled to input terminals of the first of capacitive circuits, further wherein the second matching circuit further comprise a second inductive shunt circuit coupled to input terminals of the second capacitive circuits.

4. The power amplifier circuit of claim 3 wherein the first and second inductive shunt circuits are part of an amplification stage adapted to amplify the radio frequency signal in the first and second frequency bands.

5. The power amplifier circuit of claim 3 wherein the first and second inductive shunt circuits are coupled to ground.

6. The power amplifier circuit of claim 3 wherein the first and second inductive shunt circuits are coupled to a source voltage.

7. The power amplifier circuit of claim 1 further comprising a bias network adapted to provide a bias signal to the input of each of the transistors in the array of transistors based on a power control signal.

8. The power amplifier circuit of claim 1 further comprising at least one amplification stages adapted to amplify the radio frequency signal in each of the first and second frequency bands, each of the at least one amplification stages comprising:

a first amplification circuitry adapted to amplify the radio frequency signal in the first frequency band and provide an amplified radio frequency signal in the first frequency band to the first matching circuit; and

a second amplification circuitry adapted to amplify the radio frequency signal in the second frequency band and provide an amplified radio frequency signal in the second frequency band to the second matching circuit.

9. The power amplifier circuit of claim 8 further comprising a bias network adapted to provide a first bias signal to the input of each of the transistors in the array of transistors and provide separate bias signals to each of the first and second amplification circuitries in each of the at least one amplification stages.

10. The power amplifier circuit of claim 9 wherein when operating in a select frequency band of the first and second frequency bands, the bias network is further adapted to provide the separate bias signals such that a one of the first and second amplification circuitries in each of the at least one amplification stages corresponding to the select frequency band are active and an other of the first and second amplification circuitries in each of the at

least one amplification stages not corresponding to the select frequency band are inactive.

11. The power amplifier circuit of claim 9 wherein an output power of each of the at least one amplification stages and the wideband power amplifier output stage is controlled based on controlling corresponding supply voltages.

12. The power amplifier circuit of claim 1 further comprising an output matching network having a variable impedance controlled by control circuitry, wherein the power amplifier output is coupled to radiation circuitry comprising an antenna via the output matching circuitry.

13. The power amplifier circuit of claim 12 wherein the output matching network is adapted to transform a load impedance of the radiation circuitry into a predefined load impedance.

14. A communications system comprising:

a modulator providing a radio frequency signal in one of a plurality of frequency bands; and

a power amplifier circuit comprising:

a plurality of input nodes adapted to receive the radio frequency signal, each of the plurality of input nodes corresponding to one of the plurality of frequency bands;

an array of transistors, each transistor having an input and an output, wherein the outputs are coupled together to form a power amplifier output; and

a plurality of matching circuits each coupling a corresponding one of the plurality of input nodes to the inputs of each transistor in the array of transistors, each of the plurality of matching circuits having a small impedance in the corresponding one of the plurality of frequency bands and a large impedance in others of the plurality of frequency bands.

15. The communications system of claim 14 wherein each of the plurality of matching circuits further comprises capacitive circuits coupling the corresponding one of the plurality of input nodes to the inputs of the transistors in the array of transistors.

16. The communications system of claim 15 wherein each of the plurality of matching circuits further comprises an inductive shunt circuit coupled to input terminals of the capacitive circuits.

17. The communications system of claim 16 wherein the inductive shunt circuits are part of an amplification stage adapted to amplify the radio frequency signal in each of the plurality of frequency bands.

18. The communications system of claim 16 wherein the inductive shunt circuits are coupled to ground.

19. The communications system of claim 16 wherein the inductive shunt circuits are coupled to a source voltage.

20. The communications system of claim 14 further comprising a bias network adapted to provide a bias signal to each of the transistors in the array of transistors based on a power control signal.

21. The communications system of claim 14 wherein the power amplifier circuitry further comprises at least one amplification stages adapted to amplify the radio frequency signal in each of the plurality of frequency bands, each of the at least one amplification stages comprising:

a plurality of amplification circuitries each adapted to amplify the radio frequency signal in a corresponding one of the plurality of frequency bands and provide an amplified radio frequency signal in the corresponding one of the plurality of bands to a corresponding one of the plurality of matching circuits.

22. The communications system of claim 21 further comprising a bias network adapted to provide a first bias signal to each of the transistors in the array of transistors and provide separate bias signals to each of the plurality of amplification circuitries in each of the at least one amplification stages.

23. The communications system of claim 22 wherein when operating in a select frequency band of the plurality of frequency bands, the bias network is further adapted to provide the separate bias signals such that a one of the plurality of amplification circuitries in each of the at least one amplification stages corresponding to the select frequency band are active and an other of the plurality of amplification circuitries in each of the at least one amplification stages not corresponding to the select frequency band are inactive.

24. The communications system of claim 22 wherein an output power of each of the at least one amplification stages and the wideband power amplifier output stage is controlled based on controlling corresponding supply voltages.

25. The communications system of claim 14 further comprising an output matching network having a variable impedance controlled by control circuitry of the communication system, wherein the power amplifier output is coupled to radiation circuitry comprising an antenna via the output matching circuitry.

26. The communications system of claim 25 wherein the output matching network is adapted to transform a load impedance of the radiation circuitry into a predefined load impedance.